THE AMERICAN
JOURNAL OF PHARMACY.

FEBRUARY, 1890.

ALGAROBIA GLANDULOSA.

By James Clavin, Ph.G.

From an Inaugural Essay.

Of the many various trees and shrubs, which go to make up our Southwestern sylva, there is none perhaps which deserves more, and few which have received less, notice at the botanist's hands than the mezquite of Texas and adjacent country. From personal observation and from information procured from various sources, I am enabled to refer to uses of the plant, which are not generally known. For much of the information I am indebted to Dr. V. Havard, of the United States Army, who has made an extensive study of the mezquite and its properties, uses, etc., both from a medicinal and economical standpoint.

The mezquite has been described as Prosopis juliflora by De Candolle; as Algarobia glandulosa in Torrey & Gray's *Flora*, and as Prosopis glandulosa by Torrey. The mezquite finds its home throughout Mexico and grows to some extent in South America. It flourishes to an enormous extent in the Southwestern territory of the United States, especially in Texas, where it covers countless acres of land and is by far the most common tree or shrub indigenous thereto. It is found in the Indian Territory and extends into California, following the Mexican border. It is very prolific, spreading rapidly and multiplying numerously wherever it takes root. It grows to a height of from 3 to 40 feet. Its branches are thorny and with deciduous foliage. The bipinnate leaves

occur singly or in clusters, armed generally at the base with a pair of straight whitish thorns. The compound leaf is from 4 to 7 inches long and bears from 8 to 15 pairs of leaflets, which are linear-oblong, 1 to 2 inches long and from $\frac{1}{8}$ to $\frac{1}{6}$ inch in width. The inflorescence is an axillary cylindrical, catkin-like spike, with a rather short peduncle and very fragrant. The flowers, on short pedicels, are polygamous, with a five-toothed calyx and 5 petals. The stamens are distinct, and 10 in number. Pistils have a villous ovary, truncate stigma and filiform style. The fruit consists of indehiscent legumes, 4 to 6 inches in length, compressed laterally and narrowing between the seeds, which are from 10 to 20 in number. These legumes occur in clusters, from 2 to 12 on the peduncle, and are of a light greenish-yellow, externally streaked with red, internally spongy, enclosing the seeds in separate casings. They form in Texas early in June, and through July and August the process of ripening goes on. In some dry localities they are mature before the last of June, while in other sections they could be hardly called so before the early days of September.

The leaflets have been used with great success in the treatment of inflamed eyes. They are also applied to inflamed surfaces in the shape of a poultice, and as such have their virtues. In the form of a hot infusion they are administered as a febrifuge in certain mild forms of fever. The leaflets are of an emerald-green color, a peculiar odor and a bitter, somewhat mucilaginous taste. The flowers have no medicinal uses that I have learned of. The legumes on the other hand possess properties which render them valuable. Whether they have any medicinal properties beyond that of a simple laxative is extremely doubtful, but they are economically of some considerable value. They are a first-class feed for cattle when ripe, and a plentiful crop of them is always produced no matter how dry and unpropitious be the season for products of tilled soil. They are rich in grape sugar and other nutritive principles, and are easy of digestion. When unripe though, they are apt to produce in horses and cattle the disease known as scours, a species of dysentery. A pleasant beverage, called by the Mexicans "atole," is made

from them; it is simply an infusion made by throwing the crushed ripe beans into boiling water, or by boiling them together, and afterwards straining. A fermented liquor, used to some extent in Mexico, is prepared in that country; the fruit easily undergoes alcoholic fermentation. Owing to the fact that the legumes are indehiscent and after falling to the ground are soon destroyed by insects, it is seen that the growth of the mezquite is not as dense or as easy of attainment as it would otherwise seem. The fact that these legumes are a favorite food of cattle and that their seeds always remain undigested and are passed in such a state in the fæces of cows and horses, will perhaps best explain the rapid extent of this hardy shrub or tree. An analysis made by Dr. Havard, yielded 26 per cent. of glucose, albumen and gum, traces of fats and salts were also found.

The wood, at the present time, is the most important product of the mezquite, for the reason that it furnishes in those regions, where it is indigenous, the great bulk of the fuel used; and because of its value as a timber which will stand the ravages of time. While a hard, fine-grained and easily polished wood, the fact that the centre of the trunk is often fissured, detracts considerably from its value in cabinet work. The most valuable quality is the bold front it opposes to decay, and striking proof of this is not wanting, for in the old missions and in numerous old Spanish houses these mezquite beams still support the stone roofs, though a century has passed since they were first set in place. Old hitching posts have withstood the winter's cold and summer's heat for over 25 years and are found still solid, even in the subterranean portions. This quality of the mezquite has been attributed to the tannin which it contains, and this constituent also makes it valuable as a material for tanning leather. This tannin resembles the nutgall tannin in producing the same inky precipitate with ferric salts. It is more plentiful in the heart wood than other portions of the plant. The reddish-brown heart wood is surrounded by a superficial layer of canary-yellow sap wood. Transverse sections of the wood show wavy concentric rings, the zones varying in color from yellowish to purplish-brown; the

medullary rays are so delicate as to be hardly visible to the naked eye. The line between the red and yellowish wood is distinct and abrupt and displays the sharp contrast in colors. The decoction of heart-wood chips is used in diarrhœa, and is a very valuable remedy in it and similar complaints. The bark of the mezquite is of a dirty silver-gray appearance externally, marked with whitish or somewhat lighter grayish patches in the young bark. That from older trees is seamed and deeply cracked or furrowed transversely and longitudinally and often found with mosses and various lichens adhering to it. Very young bark is of a smooth brown-gray appearance externally, somewhat striate and green beneath the thin epidermis. The bark interiorly is whitish, finely striate, very fibrous; the liber separates easily in thin layers. The transverse section of the bark shows a finely checkered appearance from the medullary rays and cork layers. The outer cork in old bark is brown and astringent to a slight extent. It yields its reddish coloring matter to water and dilute alcohol. The young and inner old bark are used as an astringent tonic, also in bowel complaint.

A peculiarity about the root of the mezquite is the immensity of its growth in those arid regions where the plant assumes such dwarfish proportions. In these regions the natives, as in the coal regions, dig for their fuel. The roots are found spreading to great distances and reaching into the earth to a depth of as much as 60 feet; in fact, wherever mezquite is found water can be procured by following its deep burrowing roots. This has been verified by the digging of wells along the Texas-Pacific Railroad. The amount of tannin in the root, from all indications, surpasses that of either the wood or bark. The amount of tannin in the wood is about between 6 and 7 per cent., this is in the heart wood. In the bark it is ·50 per cent., and in the white wood about the same. These figures are given out in an analysis made by the chemist of the Department of Agriculture. The bark is bitter, though not unpleasantly so, nor is the taste lasting.

The gummy exudation from the bark of the mezquite, has, perhaps, received more attention at the hands of scientists

than any other of the products. The gum is found to the greatest extent as an exudation from the cracked or artificially incised bark of old trees. In young trees the amount is very small, but of a lighter and much more handsome appearance, about the color of gum arabic. It exudes from the bark in the summer months, from May to September, and concretes in tears of various sizes, and ranging in color from straw-yellow to dark brown. The dark color, which has been the principal objection to the use of this gum, is undoubtedly acquired by contact with the reddish-brown outer bark, which imparts its soluble coloring matter to the gum while in its liquid state. The taste and slight astringency often found in dark specimens of the gum render this theory plausible. The gum whitens to some extent under exposure to the sun's rays. It is much superior to acacia in some respects, and were it not for the objections to its color, would, no doubt, come into extensive use; it possesses greater tenacity and is a better emulsifying agent than acacia. See also papers on "Gum Mezquite," by Wm. Procter, Jr., in AMER. JOUR. PHARMACY, 1855, pp. 14 and 223, and by H. J. Schuchard, in *ibid.*, 1885, p. 542.

GUARANA IN CHRONIC DIARRHŒA.

PHILADELPHIA, January 23, 1890.

To the Editor of the AMERICAN JOURNAL OF PHARMACY:

In looking over some old papers recently I found the following letter from Dr. J. Frazer Boughter, late of the United States Army, in reply to one of mine asking for the result of his experience in the use of Guarana powder. The very decided effect that he found it produced in a case of long-standing diarrhœa, leads to the inference that it is worth a more extended trial in that disease by the medical profession.

J. T. SHINN.

FORT CRAIG, N. M., July 22, 1875.

James T. Shinn, Esq., Philadelphia, Pa.:

DEAR SIR: Your note of 6th inst. with the box of Guarana powders received a few days ago, for which I am obliged. I will be happy to send you the results of any further trials I

may have the opportunity of making with it in case of chronic diarrhœa, etc. The case in question is that of a soldier of Co. F, 15th U. S. Inft., who for *two* (2) years has been troubled with chronic diarrhœa, better at times, at others worse; a great portion of his time in hospital. Has been in hospital now for over *two* months, becoming much worse, with *8* to *12* movements in *24* hours—all of them very offensive, containing mucus, blood, pus, etc., indeed presenting a dysenteric character. Nearly all the vegetable and mineral astringents were tried with only partial and temporary relief. The man rapidly lost flesh, became discouraged (so did I), when I happened to think of the Guarana which I had sent for—not for this case, but to use in a case of sick headache. I gave the man *one* powder *twice* daily for several days, and having only about *7* or *8*—afterwards *one* daily.

From the time of taking the first he began *at once* to improve, the number of passages from bowels diminished rapidly, and by the time the *7* or *8* powders were all taken he had but *one* passage in *36* hours or longer. To-day he is perfectly well and getting stout—eats fresh vegetables *well cooked*, and has about one passage in *36* hours. I must attribute his sudden change for the better to the Guarana, as I stopped all his medicine while taking it; since I have had him on dilute hydrochloric acid. The patient informs me that he has now the first *natural* movements of the bowels he has had for several years—nearly all of them heretofore being diarrhœtic in character.

I wrote the Post Surgeon of McKae, the next post to us, and suggested a trial of the Guarana, as they have many cases of diarrhœa there during the summer.

Very respectfully,

J. FRAZER BOUGHTER.

Arteries as Drainage Tubes.—Weeks (*Medical Age*, 1889, 380,) uses the arteries of oxen for the preparation of drainage tubes. The same are freed from adhering tissue, cut in pieces of suitable length, boiled with water for five minutes and drawn over glass rods of the requisite diameter. They are then laid for ten minutes in a 1 per cent. solution of corrosive sublimate and kept in 95 per cent. alcohol.

SOME CONSTITUENTS OF VERBASCUM, AMBROSIA AND LYCOPUS.

Abstracts from Theses.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 65.

Adolph Latin submitted the leaves of *Verbascum Thapsus* to proximate analysis and found the constituents to be ·80 per cent. of a crystalline wax, a trace of volatile oil, ·78 per cent. of resin soluble in ether, 1·00 per cent. of resin insoluble in ether, but soluble in absolute alcohol, a small quantity of tannin, a bitter principle, sugar, mucilage, and the other usual constituents. The moisture in the air dried sample amounted to 5·90 per cent., and the ash to 12·60 per cent. He concludes that the plant contains many of the usual constituents and a bitter principle which may be prepared by exhausting the drug with alcohol, evaporating or distilling the solvent, dissolving the residue in water and agitating with ether or chloroform. Several trials failed to secure this substance in a crystalline condition. It was found to be soluble in water, ether, alcohol and chloroform and to possess a decidedly bitter taste. It responded to none of the tests for a glucoside or alkaloid.

Leslie W. Schwab examined *Ambrosia artemisiæfolia*, popularly known as Ragweed, Hogweed or Bitterweed. This plant is indigenous to all parts of the United States, the droughts of the Western States are never so severe as to prevent it flourishing along waysides and waste places and in the locality of the author (Central Illinois) the crop never fails whether it be a wet or dry season. Its average height is from 2 to 3 feet. All parts of the plant are very bitter, hence the common name. The material for analysis, consisting of the leaves and smaller stems, were gathered in August.

The bitter principle was found to be a glucoside, which was partly dissolved from the plant by ether, but more completely by alcohol. On recovering the solvent, dissolving in water and agitating with ether or chloroform the bitter glucoside was obtained in an amorphous condition. The following is a summary of the constituents found :

	Per Cent.
Volatile oil,	0·10
Fat melting at 60° C.,	1·80
Wax melting at 68° C.,	0·08
Resin, Chlorophyll and Glucoside,	2·78
Gum and Mucilage,	1·61
Dextrin and Glucose,	2·89
Saccharose,	1·97
Albuminoids,	1·87
Pectin,	2·42
Incrusting substance,	17·78
Lignin and Cellulose,	51·19
Ash,	9·25
Moisture,	6 26
	100·00

Joseph L. Weil analyzed *Lycopus virginicus* and found it to contain 0·41 per cent. of a fat melting at 50° C., 0·68 per cent. of a granular wax melting at 70° C., a small amount of gallic acid, 0·43 per cent. of a crystallizable resin soluble in ether, chloroform, benzol and slightly soluble in 95 per cent. alcohol, a small quantity of tannin, a crystallizable glucoside and the usual plant constituents.

The crystalline glucoside may be obtained by extracting the drug with ether, recovering solvent and treating residue with water which removes the glucoside, from which it may be removed by agitation with ether. Alcohol may be used instead of ether to exhaust the drug. The glucoside decomposes so readily that it is difficult to obtain pure, the products of decomposition being an amorphous resin-like body and glucose.

The crystalline resin can be obtained in the same extraction with ether. After the removal of the glucoside from the ethereal extract by water, the resinous residue when dissolved in hot absolute alcohol, will in part deposit as crystals, which soften at 113° C., but refuse to melt at 200° C.

The drug is used almost exclusively by the Eclectics.

Resorcin in Whooping Cough.—Dr. Andeer (*Centralbl. f. Med. Wiss.*) employed resorcin successfully in the complaint named, giving to children half a wineglassful of a 2 per cent. solution in water, of which a portion was directed to be used as a gargle.

EUPATORIUM PURPUREUM.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy—No. 66.

In the American Jour. Pharmacy, 1876, p. 331, appears the following paragraph in the minutes of the Pharmaceutical Meeting: "Prof. Maisch donated —— from J. U. Lloyd a specimen of a yellow neutral crystallized principle obtained from the root of *Eupatorium purpureum*. It is quite soluble in hot, slightly so in cold alcohol, and insoluble in water; does not unite with dilute acids, is decomposed by strong sulphuric acid, is tasteless, and as far as known has no medicinal value."

This statement has frequently attracted my attention, and is evidently the origin of the remark in the *National Dispensatory* (3d edit., p. 598), that such a principle exists, and that it is probably identical with *quercitrin*. I, therefore, determined to investigate the whole subject, and in the summer of 1887 collected some of the leaves of the above plant, and had them analyzed by F. M. Siggins, Ph.G.,[1] who failed to find any unusual plant constituents. Especial attention was given to find the above-mentioned crystalline compound, and had we then possessed the information I now have concerning it, the result might have been different.

In the summer of 1888, I collected a quantity of the rhizomes with attached rootlets, and they were analyzed during the following winter by G. Herbert Ray, Ph.G., and the results presented in a graduation thesis.

Mr. Ray's investigation was very carefully conducted, and the results I consider very accurate, although, for reasons that will be given later, he failed to find the crystalline compound. The following is a full abstract of his paper which has not previously been published.

Purple Boneset, Trumpet Weed, Gravel Root or Queen of the Meadow, as might be supposed from its botanical name, has some purple characteristics, and these are found in its purplish colored stem and flowers. The rhizome and rootlets

[1] Am. Jour. Pharmacy, 1888, p. 121.

are the parts used medicinally, and therefore have been the parts examined.

No description of the drug appearing in print, it is thought advisable by the writer that such should be given.

The plant is found growing abundantly in low places, and attains a height of from three to twelve feet and even more. The rhizome is horizontal, one to four inches long, one-half to three-fourths of an inch in thickness, and with many thin, rather tough rootlets. It is brownish-black externally, yellowish internally, and breaks with difficulty. The medulla is darker than the other portions, the odor slight but peculiar, taste bitter, bark thin and the word wedges about twenty-six in number, but not as wide as the medullary rays. The rootlets are lighter in color, four to eight inches long, with a thick, easily removable bark, inclosing a tough central cord.

The drug in very fine powder yielded to petroleum ether 0·89 per cent., consisting of volatile oil 0·07 per cent., fat melting at 60° to 63° C., 0·53 per cent., and wax melting at 100° C., 0·29 per cent.

Stronger ether extracted only 0·25 per cent. from the residual drug, this was insoluble in water, but consisted of a yellow resin-like uncrystalline substance, which gave negative results with tests applied for quercitrin and quercetin. The melting point of this ethereal extract was 72° C.

From the remainder of the drug absolute alcohol extracted 1·10 per cent., most of which was soluble in water. Both the soluble and insoluble portion failed to respond to any tests for quercitrin or quercetin. Glucosides, alkaloids, gallic and tannic acids were shown to be absent. The portion insoluble in water somewhat resembled the ethereal extract, although it required a temperature of about 100° C. to melt it. Alcoholic solution of lead acetate failed to produce any reaction in an alcoholic solution of this portion not dissolved by water, or in that of the ethereal extract. The remainder of the analysis is best quoted by giving the following summary:

	Per Cent.
Volatile oil,	0.07
Fat,	0.53
Wax,	0.29
Yellow resin dissolved by stronger ether,	0.25
Soluble in absolute alcohol,	1.10
Mucilage,	2.76
Dextrin,	2.88
Saccharose,	2.04
Glucose,	2.29
Albuminoids,	1.36
Other organic matter soluble in dilute alkali,	2.34
Calcium Oxalate,	1.82
Incrusting substances,	5.15
Cellulose and lignin,	54.80
Ash,	14.90
Moisture,	7.74
	100.32

A small quantity of organic acid found in the aqueous extract of the drug proved to be citric acid. The author concludes by stating that the rhizome is peculiar for the large percentage of cellulose contained in it, and for the small amount of material extracted by the usual solvents, and that the only evidence of a crystalline principle is resin capable of assuming a granular form, but which in no way responds to the tests for quercitrin or quercetin.

Mr. Ray's conclusion regarding the crystalline principle would, no doubt, have been different, had he operated on a larger quantity of the drug, which would have allowed him to recrystallize the granular resin and so obtain it in the acicular form. The amount operated on was 50 grms., but 200 or 300 grms. were afterward exhausted with absolute alcohol, but additional material, which in the original analysis was removed by ether and petroleum ether, being present prevented the purification of what was still a small quantity.

While hesitating about publishing Mr. Ray's results, I was shown some crystalline substance by Mr. E. G. Eberhardt, a student of this college, who, while recently in the employ of Eli Lilly & Co., Indianapolis, obtained it from a sediment in a fluid extract of the above-mentioned drug.

As Prof. Lloyd is the discoverer of the compound, he was communicated with and immediately forwarded a freshly pre-

pared sample, followed somewhat later at my request by this report:

"Concerning the yellow crystalline principle of *Eupatorium purpureum*, I will say that it was first obtained by me between the years 1870 and 1875, I cannot give exact date of discovery. For some time it remained a private cabinet specimen only, but finally I forwarded a sample to Prof. Maisch for his cabinet, and he donated it to the Philadelphia College of Pharmacy."[1]

"This material belongs to the class of organic bodies that, after once having been separated from natural associations, present marked characteristics, but which persistently refuse to assert to their individualities while in the society of accompanying extractives. Hence, in endeavoring to crystallize it from any natural extractive liquid, the experience of the investigator is discouraging, for it assumes an amorphous condition as a part of the extractive, and redissolves when the extractive matter is dissolved without exhibiting itself, even to the microscopist.

"In order to prepare it, I employ the principle that I have learned is often desirable in liberating plant constituents, *i. e.*, the preliminary separation of extraneous extractives and then crystallization of the desired substance from an appropriate menstruum. Under these conditions the principle under discussion is easily developed, and afterwards exhibits a marked separate existence, being indeed characterized by a strong tendency to separate in beautiful crystalline tufts immediately upon the reduction of temperature of its hot alcoholic solution.

"*Preparation.*—Exhaust finely ground or powdered root of *Eupatorium purpureum* in a menstruum composed of three parts of alcohol and two parts of water. Evaporate the percolate to the consistence of thick honey, and pour it into cold water, stirring well. After a day (or when the dark-colored precipitate has subsided) decant the overlying aqueous solution and wash the precipitate with a fresh por-

[1] This specimen is still in the College Museum and was, with the other crystals, exhibited at the reading of this paper.

tion of cold water, and dry it. Then boil this insoluble substance in an appropriate amount of officinal alcohol, filter and upon cooling the substance separates in brownish-yellow crystals. The crystals should be purified by recrystallization from hot alcohol, when they assume a deep yellow color.

"The precipitate that sometimes collects in fluid extract of *Eupatorium purpureum* usually contains a considerable proportion of this substance. In the course of time, a large container of such a fluid extract forms (as other liquids also do) zones of different gravities and different compositions. At one of the lines, under these circumstances, the substance reaches a crystallizable condition, or a freedom from associates, that permits it to assume a crystalline form, and it shoots into existence in masses often of large crystals. These formations are likely to form a belt near the *top* of the liquid and on the coolest portion of the container.

"Concerning a name, since both names of the plant have been appropriated (*purpurin* from madder and *eupatorin* from boneset), it seems difficult to formulate a name in the usual manner (denoting its origin) without creating confusion. If your chemical examination does not determine it to be identical with *quercitrin* (which I doubt), and if it is not possessed of characters in a chemical sense that will permit you to give it an acceptable name therefrom, it might be well to affix a name combining the generic and specific names of the plant, for example, *Eupapurin*, or, indeed, the briefer name *Euparin* might be better."

Under my direction Mr. Eberhardt made an investigation of the two samples, which he found to be identical.

The purification of the yellowish brown mass was accomplished by repeatedly dissolving in hot absolute alcohol and allowing to crystallize. By this treatment the crystals became more distinctly acicular, and of a lighter yellow, but with a decided brownish shade. A portion was then taken, and, after solution in warm alcohol, digested with animal charcoal, which resulted in a bright lemon-yellow product, although, as will be seen, without materially changing the composition.

These crystals both before and after treatment with animal

charcoal, melted at 117·2° C., at a higher temperature they decomposed and burned without leaving any residue. They were found to be insoluble in water, sparingly soluble in petroleum ether, easily soluble in ether, chloroform, benzol, carbon di-sulphide and boiling alcohol. They dissolved in strong aqueous solutions of potassium or sodium hydrate, but separated unchanged on the addition of a small quantity of water.

They were not affected by concentrated hydrochloric acid or nitric acid; conc. sulphuric acid dissolved them with a dark red color, changing to bluish green.

The crystals from Eli Lilly & Co., after purification from hot alcohol, gave the following when submitted to elementary analysis:

I, ·1982 gram substance gave ·5162 gram CO_2 and ·0985 gram H_2O
II, ·2197 " " ·5735 " " ·1049 " "

	I. Per Cent.	II. Per Cent.
C,	71·03	71·17
H,	5·52	5·30
O,	23·45	23·53
	100·00	100·00

The sample from J. U. Lloyd, after a similar purification, yielded the following:

I, ·2276 gram substance gave ·5915 gram CO_2 and ·1104 gram H_2O
II, ·2132 " " ·5526 " " ·1053 " "

	I. Per Cent.	II. Per Cent.
C,	70·88	70·69
H,	5·39	5·48
O,	23·73	23·83
	100·00	100·00

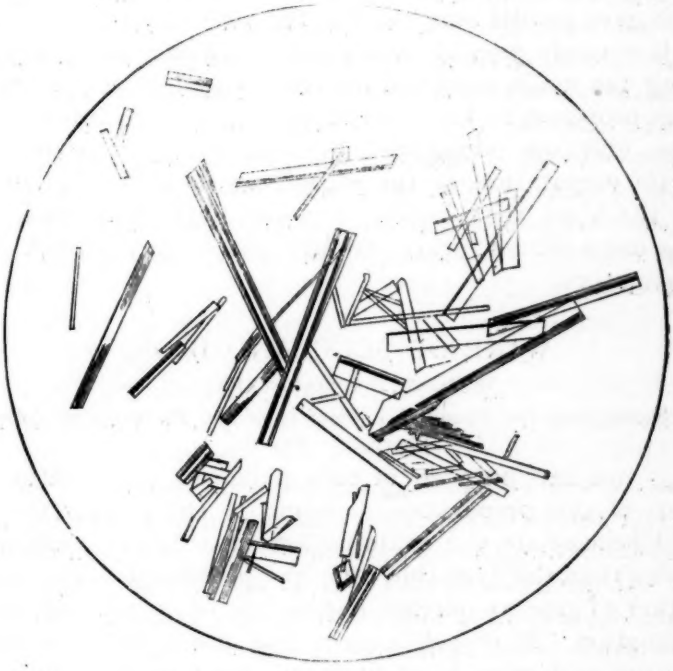
One of the samples was then taken and purified by animal charcoal, which yielded a product so much brighter in color that a combustion was made in order to determine if a chemical change had taken place.

The following results show that no material difference occurred:

I, ·2014 gram substance gave ·5241 gram CO_2 and ·0930 gram H_2O
II, ·2143 " " ·5596 " " ·1004 " "

	I. Per Cent.	II. Per Cent.
C,	71·00	71·25
H,	5·13	5·20
O,	23·87	23·55
	100·00	100·00

The crystals obtained by this purification with animal charcoal appeared in acicular tufts when viewed by the naked eye, but under the microscope were found to have the more prismatic form shown in the accompanying figure.



A few more elementary analyses were made of this substance, amounting to ten in all, the average of which gave the following percentages and formula:

	Average of 10 Analyses. Per Cent.	Calculated for ($C_{12}H_{11}O_5$). Per Cent.
C,	70·98	70·94
H,	5·41	5·42
O,	23·61	23·64
	100·00	100·00

It is evident from the above analyses and reactions that this compound is not quercitrin or quercetin. The only known compound that it resembles is vulpinic acid, but even this is excluded by its composition. In order to determine if the new substance possessed any acid properties, it was treated with a concentrated solution of potassium hydrate, which dissolved it, but allowed it to precipitate on the addition of a small quantity of water. The precipitate was shown to have the same composition as the original material by washing and then submitting it to an ultimate analysis, which gave results very close to the above average.

It is scarcely possible, therefore, to classify this compound among the acids, consequently the adoption of one of the names proposed by Prof. Lloyd would be a convenience.

The first one suggested by him resembles that of an eclectic preparation, so the second one "*Euparin*" is offered, with the hope that, having a name, this compound, after being dormant for nearly twenty years, may attract other investigators.

WINE OF BEEF AND IRON.

By E. G. Eberhardt, Ph. G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy—No. 67.

It is not the purpose of this paper to demonstrate the quality of this preparation as found in the market, for that would necessitate the examination of a larger number of samples than the available time has permitted. The object is rather to give an outline, if possible, of a method for its examination. It is well known that much of the so-called beef, iron and wine is of uniformly poor quality, while the remainder is perhaps as good as the existing conditions and the exacting palate of the consumer will permit. Leaving aside the question of its nutritive value we will consider the matter from a pharmaceutical point of view. The claim of the larger manufacturers is that in each fluid ounce are contained 4 grains of citrate of iron and ammonium and the equivalent of two ounces of fresh beef dissolved in a good quality of sherry wine. The price at which the article is

sometimes sold warrants the suspicion that in many instances a very cheap wine is used. As to the extract of beef, Hager states that 10·0 of extract and 250·0 of fresh beef are considered equivalent and on this basis the fluid ounce then should contain about 38 grains of the extract. In making the preparation we find that the latter is not completely soluble in the wine and on standing precipitation continues for a considerable length of time. A manufacturer may thus send out a quantity in good condition but by the time it reaches the dispenser or consumer it contains an unsightly precipitate. To obviate this, some seem to adopt the very radical and economical method of leaving out the beef. Others put in as much as they safely can and bravely face any complaints, or again it is stored away until precipitation ceases before being put upon the market. In one instance that has come under the author's notice the maker evidently diluted the wine—perhaps to furnish a better solvent—and finally forgot to put in the beef. These remarks must not be understood as applying solely to the large manufacturers, but also to the many smaller firms and individuals that make a specialty of this preparation.

While it is comparatively easy to estimate the iron it becomes a matter of extreme difficulty to determine with exactness the quantity of beef in such a mixture. An approximate estimation, however, of the quality of a sample can be made with the ordinary apparatus of the laboratory.

In the samples under examination determinations were made of the specific gravity, of alcohol, solids, ash, iron, phosphoric acid, the amount insoluble in alcohol and its ash and total nitrogen. I will briefly outline the methods used.

The specific gravity was taken with the bottle at 20° C., this temperature being adopted as more convenient.

The percentage of alcohol was determined according to the method of the Pharmacopœia, and where the quantity at hand was sufficiently large, a definite volume was distilled, both distillate and residue made up to the original volume and the alcohol calculated from their respective specific gravities, taking the mean of the two results, as recommended by Allen.

Solids were estimated by evaporating a definite volume (20 cc.) in a platinum capsule and drying the residue at 110° C., until the loss did not exceed a milligram per hour.

This residue, by incinerating to a constant weight, yielded the ash.

From a solution of the latter in dilute hydrochloric acid, the iron was precipitated as hydrate by ammonia. After thoroughly washing, the precipitate was redissolved, in hydrochloric acid and precipitated a second time by an excess of potassium hydrate to separate any alumina present. This precipitate collected, washed, dried and ignited, yielded the iron as Fe_2O_3. The presence of phosphates did not interfere, as was proven by precipitating the iron in a parallel experiment as basic acetate.

Phosphoric acid was estimated in the ash by precipitating it from a solution of the latter, first as ammonium phosphomolybdate and subsequently from the ammoniacal solution of the latter as ammonium magnesium phosphate. This precipitate was collected, washed, dried, ignited, and the residue weighed as $Mg_2P_2O_7$, calculating therefrom the phosphoric acid.

To determine the amount insoluble in alcohol 25 cc. were evaporated on a water-bath to 5 cc., and 50 cc. of strong alcohol added while stirring. When allowed to stand sufficiently long, it was found that the precipitate deposited on the sides and bottom of the beaker, so that the clear liquid could be decanted. When not perfectly clear, the liquid was filtered and the beaker then carefully rinsed with a little alcohol, passing the washings through the same filter. Any residue on the filter was then washed back into the beaker with a little distilled water, and the entire precipitate—in most cases completely soluble—transferred to a platinum dish. The solid matter and finally the ash were estimated in this as above.

The total nitrogen was determined by Varrentrapp and Will's method of heating in a closed tube with soda lime, absorbing the NH_3 generated in a measured quantity of standard acid, and then titrating the latter with standard alkali. Every cc. of normal acid neutralized by NH_3 is

equivalent to ·014 of nitrogen. Normal solutions of oxalic acid and sodic hydrate were employed.

In order to make more accurate comparisons, two samples of beef extract, designated in the table below as A (Liebig's) and B (Armour's) and one of imported sherry wine, C, were examined in connection with the beef, iron and wine. Of the latter, D was made by a local pharmacist, E by a well-known manufacturing house and F by the author, making it to conform as nearly as possible to the formulas given by the manufacturers; D was purchased directly from the maker and E was obtained in the open market. The results of the investigation were as follows:

Sample.	Specific Gravity.	Per Cent. Alcohol by Weight.	Per Cent. Solids.	Per Cent. Ash.	Per Cent. Iron. Fe_2O_3.	Per Cent. Phosphoric Acid.	Precipitated by Alcohol.		Per Cent. Nitrogen.
							Per Cent. Solids.	Per Cent Ash.	
A,	—	—	79·41	17·88	—	—	31·8	12·68	8·14
B,	—	—	81·75	17·94	—	—	30·	12·38	7·06
C,	·9922	16·9	3·634	·396	—	·032	·655	·364	—
D,	1·0039	2·58	1·953	·184	·160	·012	·877	·139	·025
E,	1·0378	15·7	11·856	·975	·304	·015	6·150	·689	·148
F,	1·0246	13·77	9·645	2·159	·197	·082	4 638	1·400	·765

On comparing the sensible properties of D, E and F, it was found that F had a light amber color, somewhat darker than the wine of which it was made, and a pronounced taste and odor of extract of beef. E was of the same color, but had a decidedly more pleasant odor and taste, containing, as it did, sugar and flavoring material. D was darker than the other two, its color being suggestive of caramel. It had also an aromatic odor and a bitter taste, becoming toward the last somewhat ferruginous. The bitter taste was probably due to gentian. That it was not due to alkaloids was proven by experiment. On looking at the table, we see that in this

particular sample the specific gravity was very low; the percentage of alcohol from one-fourth to one-fifth of what it should be, total solids and ash one-half as much as found in simple sherry wine and the amount of nitrogen yielded was well within the ordinary limit of error. The claims made for this article are very comprehensive, but too indefinite to merit attention.

The figures obtained from sample E show at once that it contains some beef; not as much, however, as the claim would warrant as can be seen by comparing with results from sample F. The former contains a little over 2, the latter about 8 per cent. of the extract. The larger amount of solids in E is accounted for by the presence of sugar. Its percentage of ash is less and of iron greater than in F, showing that the larger portion of the solids are material other than beef. I may state here that D represents the very poorest quality, E a fairly good article and F a standard preparation, according to the claims of the manufacturers.

Both wine and extract of beef vary in their percentage composition. According to Hager, extract of beef contains 19–22 per cent. of moisture, leaves 15–22 per cent. of an ash containing 27–37 per cent. of phosphoric acid, and yields 6–8·5 per cent. of nitrogen. Wine, according to the same authority, yields ordinarily 1·5–5 per cent. extractive, ·2–·4 per cent. of ash and ·015–·060 of phosphoric acid. This variation occurs not only between different brands, but between different lots of the same brand, depending in extract of beef upon the condition of the source and process of manufacture, while in wine we have the additional influence of age. Under such circumstances it is impossible to make any accurate deductions. The most reliable indications are afforded by the estimation of nitrogen and ash, and the percentage of these decreases as precipitation in the preparation continues, *i. e.*, as it becomes older.

Phosphates are readily precipitated by alcohol, and, besides, both wine and extract show a fairly wide range of variation in them, so that their estimation seems of no particular value.

Precipitation by alcohol yields no better indication than the

simple estimation of ash, but is of value as corroborative evidence.

The presence of ammonia in the iron salt slightly increases the yield of nitrogen (nearly ·015 for every ·100 of Fe_2O_3) so that about ·09 gm. correspond to one per cent. (1 gm.) extract of beef. This would give for E 1·65 and for F 8·5 per cent. of extract.

Deducting from the ash the percentage of ferric oxide plus ·2 (per cent. of ash in wine), and multiplying the remainder by five (extract of beef leaves about one-fifth to one-sixth its weight of ash) we get a product approximating the percentage of beef. For E the result is 2·35, for F 8·81 per cent. Both are slightly above but very near the truth.

As to the quality of the wine employed we have no safe criterion. The alcoholic strength and general physical properties being the only indication in this respect.

A wine of beef and iron of standard quality should contain from 12–16 per cent. of alcohol, 10 per cent. and upwards (not exceeding 12) of extractive, yield about 2 per cent. of ash, ·2 per cent. of Fe_2O_3, and from ·5–·75 of nitrogen. About one-half of the solids and two-thirds of the ash should be found in the portion precipitated by alcohol. Any sample yielding much less than 1 per cent. of ash and ·15 per cent. of nitrogen can be safely put down as containing very little beef.

In conclusion, the process of examination can be summed up as follows:

1. Note physical properties, color, odor, taste.
2. Determine the percentage of alcohol.
3. Determine total solid constituents.
4. Incinerate a portion and determine the amount of ash.
5. Estimate the amount of ferric oxide present.
6. Precipitate a portion by alcohol and estimate the percentage of solids precipitated and their ash.
7. Make an estimation of nitrogen.

Adulterated Saffron.—Et. Ferraud (*Revue Internat. des Falsificat. des Denrées aliment.*, 1889 (3), 42–43) noticed a saffron yielding 26 per cent. of ash, composed to the greatest part of barium sulphate, and containing 11–12 per cent. of honey and a coloring matter, probably an azo color.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph G.

Diuretin is the name under which a soluble salt of *theobromine* is placed upon the German market; *theobromine-sodium salicylate* is its composition, and it contains 50 per cent. theobromine. It forms a white powder, soluble in less than half its weight of warm water without precipitating after cooling (theobromine is soluble in 1,600 parts of water). The powder as well as its solution should be preserved in well-corked vials. It is given in single doses of one gram each, the daily dose being six grams; diuretin is characterized by its direct action upon the kidneys, and has been found useful in kidney and heart affections in which digitalis and strophanthus failed to act.—*Apotheker Ztg.*, 1889, 1338.

The presence of *Aloes* in *Fluid Extract of Cascara sagrada*, has been the subject of an investigation by Ludwig Reuter, who recommends Klunge's cupraloin reaction as the best means of detecting the adulteration: 10 to 20 drops of the extract are evaporated to dryness in a watch crystal, the residue mixed with cold water and the aqueous solution filtered: to the filtrate are first added a few drops of copper sulphate solution, then a little sodium chloride solution, and finally, a few drops of alcohol, a violet-red coloration indicating the presence of aloes.—*Pharm. Ztg.*, 1889, 745.

Exalgin or methylacetanilid $C_6H_5N(CH_3)C_2H_3O$ is prepared by the action of acetylchloride C_2H_3OCl upon monomethylaniline $C_6H_5NHCH_3$ there being also produced methylaniline chlorhydrate $C_6H_5NHCH_3,HCl$. It is obtained in white crystals melting at 100°, boiling at 245° C., easily soluble in alcohol, difficultly soluble in water. Among its tests may be noted: (1) If exalgin be boiled with solution of potassium hydrate, allowed to cool, diluted with water and a little fresh chlorine water now added, the solution becomes transiently cloudy, then for one to two minutes colorless, after which it assumes a pure blue color; acetanilid in the same manner forms an orange-red color. This test allows the detection of acetanilid in exalgin. (2) The simplest test by which exalgin can be distinguished from acetanilid, phenacetin and methacetin depends

upon the solubility in HCl and the behavior upon addition of concentrated nitric acid: 0·1 gram exalgin dissolves easily in 1 cc. concentrated HCl (phenacetin is insoluble) and is not reprecipitated (acetanilid); the solution should remain colorless on addition of one drop of concentrated nitric acid (methacetin causes a red-brown coloration).—E. Ritsert, *Pharm. Ztg.*, 1889, 754.

Methysticin, the crystalline principle present in the root of Macropiper Methysticum and prepared by extraction with boiling 80 per cent. alcohol, allowing to cool and repeatedly crystallizing the crystals obtained from 70 per cent. alcohol, has the following properties, according to Dr. C. Pomeranz: White silky prismatic needles, odorless and tasteless, melting at 137° C; insoluble in cold water, slightly soluble in hot water, petroleum ether and ether, more soluble in cold alcohol, chloroform and benzol; the best solvent is boiling alcohol; it is not volatile, decomposing on heating with evolution of aromatic yellow vapors; with concentrated sulphuric acid it colors purplish-violet. Methysticin does not contain nitrogen having the formula $C_{10}H_{14}O_5$ and is the methyl ether of methystic acid $C_{14}H_{12}O_5$; the statement is contradicted that by its oxidation benzoic acid is formed.—*Pharm. Post*, 1889, 910.

Lard Substitutes for Ointments.—(1) Lanolin 65 parts, paraffin oil 30 parts and ceresin 5 parts. (2) Anhydrous lanolin 35 parts, vaselin 53 parts, white ceresin 7 parts and distilled water 5 parts. The latter preparation is known as "Unguentum medicinale" or "Adipatum," and is useful in preparing stock ointments (rancidity being impossible) and in making ointments containing silver nitrate or potassium permanganate.—*Pharm. Ztg.*, 1889, 745.

Chlorinated Lime.—E. Koefoed has made experiments upon this substance to ascertain if it contain the compound $CaOCl_2$, or if be a mixture of calcium chloride and hypochlorite. His conclusions are that chlorinated lime contains both chloride and hypochlorite of calcium, and are based upon the following two observations. (1) If an aqueous solution of bleaching powder be dialyzed, the dialysate will contain approximately twice as much calcium chloride as hypochlorite.

(2) Chlorinated lime, treated with water, will yield to the solvent considerably more calcium chloride than calcium hypochlorite. These experiments would indicate a mechanical mixture of the two salts and not a definite chemical compound.

The action of *bleaching powder* upon *alcohol* was also reinvestigated, with these results: If a clear solution of the bleaching powder be warmed with alcohol there will be liberated small quantities of chlorine and oxygen, with formation of calcium carbonate and hydrate; calcium formate could not be detected among the products. The experiments lead him to results indicating that from 3 molecules calcium hypochlorite there are formed 1 molecule chloroform, 1 molecule calcium carbonate and ½ molecule calcium hydrate; writing alcohol as $CH_3—CH_2OH$, the CH_3 group is chlorinated to form CHCl, while the group CH_2OH is changed by oxidation into CO_2 and H_2O.—*Pharm. Ztg.*, 1889, 747.

Hydrofluosilicic and fluoboric acids (H_2SiF_6 and HBF_4) as well as their soluble salts, possess in a very marked degree the property of preventing fermentations. A ten per cent. glucose solution, to which four per cent. yeast had been added, did not show any signs of decomposition when kept for weeks at 30–35° C., if 0·1 to 0·5 per cent. of the calcium salts of the above acids were present. Grape juice, with 0·2 per cent. of the same salts, will keep well at 30–35°; starch paste, under the same conditions, remains also unchanged.—F. J. Homeyer, *Pharm. Ztg.*, 1889, 761.

A quantitative estimation of cellulose, which is simple and convenient, in that the crude material is taken without previous extraction with solvents, is as follows: 10 grams of the material, with 3–4 times its weight of sodium or potassium hydrate and 30–40 cc. water, are placed in a tubulated retort and heated in an oil-bath, the temperature of which is obtained by use of a thermometer, the bulb being in the same line with the bottom of the retort. When heated to about 140° C., effervescence commences, and the temperature is then slowly allowed to reach 180°; one hour's heating at this temperature is generally sufficient, the end of the reaction being noticed by the mass becoming dry. The retort removed from the oil-bath is allowed to cool to 80° C., warm

water added and the contents rinsed into a beaker; after cooling, the solution is acidified with dilute sulphuric acid, which causes the formation of a flocculent precipitate, containing the fine particles of cellulose which were suspended in the alkaline solution; by the careful addition of a dilute sodium hydrate solution an alkaline reaction is obtained, causing the precipitated substances, with the exception of the cellulose, to redissolve. The solution is filtered, by aid of a filter pump, through a very finely-perforated platinum cone, the precipitate thoroughly washed with hot and cold water, then again removed to the beaker, digested with alcohol, refiltered and washed with ether. The precipitate is dried in a water-bath, weighed, ignited and the ash subtracted from the first weight, the difference giving the pure cellulose. This determination can be made in 5–6 hours, and the results are exact.—Dr. G. Lange, *Ztschr. f. Physiol. Chem.*, 1890, 283.

Bromoform has recently been recommended by Dr. Stepp in the treatment of whooping-cough. The daily dose ranges from 5–10–15–20 drops in four fl. ozs. water (f℥i–f℥ij alcohol increases the solubility of bromoform in water) given in hourly doses of one to two teaspoonfuls. The dose is in direct proportion to the intensity of the infection and the age of the patient. Bromoform differs from chloroform (which was also used, but found to be of no value) in its internal administration by not acting upon the mucous membranes. It is prepared by adding bromine to a solution containing equal parts of potassium hydrate and methyl alcohol until a faint yellow color appears; the bromoform is freed from acid by washing with sodium carbonate solution, dehydrated over calcium chloride and rectified. It forms a colorless liquid, sp. gr. 2·8, boils at 150° C., and is only slightly soluble in water, 100 cc. water dissolving after persistent agitation only 5–6 drops.—*L. Reuter in Pharm. Ztg.*, 1890, 5.

A superior black ink, which is not affected by water or acids, is made by mixing warm solutions of potassium bichromate and gelatin, exposing to sunlight for one-half hour, adding a solution of nigrosin in water, filtering, and finally adding a few drops of creasote.—(Ind. Bl.) *Pharm. Post*, 1889, 877.

The purification of alcohol by Schmitt's method consists in taking crude alcohol containing 30 per cent. by volume, adding potassium carbonate (not enough to cause two layers to form), and agitating with petroleum ether; this solvent removes completely the fusel oil from the alcohol. After separating the light layer, potassium carbonate is added to the alcohol in sufficient quantity to form two layers, the lower one consisting of a saturated solution of potassium carbonate, the upper one of 94 per cent. alcohol containing a small quantity of potassium carbonate. The alcohol layer is syphoned off and mixed with just sufficient strong sulphuric acid to precipitate the potassium salt as sulphate which is insoluble in alcohol of 94 per cent., and which can then be removed. Alcohol purified in this manner, without distillation, it is claimed, can not be distinguished from that purified by the usual method.—(*Ztschr. f. landw. Gew.*) *Pharm. Centralhalle*, 1889, 722.

A convenient disinfectant is made by forming into pastilles paraffin 9·5; iodine, 1·0, and salicylic acid 2·0. These pastilles are burnt in the rooms to be disinfected or deodorized; the products of the combustion contain iodine and carbolic acid, upon which their value depends.—(*D. Med. Ztg.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 622.

Resorcin as an Antivomicum.—J. Andeer has noticed that chemically pure resorcin, unlike the impure resorcin which always causes vomiting, is the best of the remedies for checking vomiting, especially in disorders of the stomach. Other investigators have confirmed the accuracy of the above. It has also been used successfully as an antidote for various emetics.—(*Ztschr. f. Ther.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 649.

Two New Antipyretics.—Prof. Dr. Michaels has applied for patents for the preparation of *acetylethylenphenylhydrazin* and *ethylenphenylhydrazinsuccinic acid*, which will soon be introduced and claim the attention of practitioners. The former is prepared by dissolving ethylenphenylhydrazin in an excess of acetic anhydride, and boiling for a short time, after cooling acetylethylenphenylhydrazin crystallizes out, and is purified by recrystallization from alcohol; it forms colorless needles,

melting at 222° C. Ethylenphenylhydrazinsuccinic acid is made by dissolving equal parts by weight of ethylenphenyldrazin and succinicanhydride in alcohol, boiling for a short time, when a crystalline mass of the compound is formed which is purified by washing with alcohol. It is soluble in hot water, slightly soluble in alcohol, easily soluble in solution of sodium carbonate, from which the acid is reprecipitated by addition of hydrochloric acid; it melts at 303° C.—(*Südd. Apoth. Ztg.*) *Oesterr. Ztschr. f. Pharm.*, 1889, 649.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

PHOSPHOGLYCERITES OF LIME AND SODA.—At a meeting of the *Société de Pharmacie de Paris* (Nov. 6), M. Varenne proposed that these preparations be tested in therapeutics. The soda salt is very soluble in water, and the lime salt dissolves readily if a small quantity of hydrochloric acid be added. The author does not give the formula for the present, having a doubt as to whether or not he has obtained chemical combinations in his mixture.

COMPARATIVE ACTIVITY OF THE DIGITALINS.—M. G. Bardet (*Acad. des Sci.*), reports recent researches upon amorphous or crystallized digitalin—the digitoxin of German chemists—and with digitalein, which, in Germany is called digitalin. He arrived at the following conclusions: Crystallized and amorphous digitalins prepared according to the French Codex, are wholly soluble in chloroform. They have an identical activity and are uniform in their effects. The German digitoxin is incompletely soluble in chloroform, and its activity is from two to three times less than the digitalin of the codex. French digitalein and German digitalin, both of which are soluble in water and insoluble in chloroform, are not definite products. They have a like activity and therapeutic action, but the action is twenty to twenty-five times less than the digitalin of the codex or chloroformic digitalin. On the other hand, it is possible that the action upon the heart may not be exactly the same as the action of the digitalin of the codex.—*J. de Ph. et de Chim.*, Dec. 1.

POSOLOGY OF CHLORAL.—In the *Archives de Neurologie* M.

Yvon cites the principal mixtures now in use for the administration of chloral. As a HYPNOTIC: Chloral, 2 to 5 gm.; bromide of sodium, 1 to 3 gm.; syrup of codeine and syrup of laurocerasus, āā 15 to 20 gm.; water, 100 gm. For CARDIAC DYSPNŒA (Sée): Chloral, 2 to 4 gm.; potassium iodide, 1·25 gm. to 2 gm.; mucilage, 120 gm.; a tablespoonful every hour. ENEMA FOR CONVULSIONS: Musk, 20 cgm.; camphor, 1 gm.; chloral, 50 cgm. to 1·50 gm.; yelk of egg, No. 1; water, 100 gm. FOR SUPPOSITORIES: Chloral, 1 gm.; cacao butter, 3 gm.; ext. hyoscyamus, 1 to 2 cgm.

INCOMPATIBILITY OF ANTIPYRINE WITH NAPHTHOL.—M. Chabrol (*Bull. com.* Nov.), having received a prescription for napthol β and antipyrine, āā 10 cgm., with salicylate of bismuth, 25 cgm., for 1 cachet, to make eight in all, found that his mixture turned at once to a damp paste. He mixed the ingredients in several ways, but the result was always the same. He finally obviated the difficulty by first mixing the antipyrine with five times its weight of sugar. He expresses the opinion that physicians would perhaps do well to be cautious about prescribing combinations of new drugs whose reactions are as yet imperfectly understood, but which are liable, as in this instance, to give rise to chemical compounds which may prove injurious or dangerous.

PREPARATION OF SOLUBLE TAR.—The object is to get solubility in water for vegetable tar and all of its components. Saline waters do not dissolve tar, either pure or combined with an alkali. But tar, when saponified was very soluble in distilled water after elimination of the excess of alkali. Following this indication, the following formula was devised, quite different from those thus far published. Take of Landes tar (from Pinus maritima), 1,000 gm.; dry soda, 140 gm.; water, 800 gm. The soda, in solution, is poured over the tar, stirring, and left in contact for two hours. Another mixture is made as follows: Water, 9 kil. 200 gm.; marine salt, 2 kil. 500 gm.; crys. carb. soda, 1 kil. 250 gm. The salts are dissolved in boiling water and to this is added the first solution. After 5 minutes of stirring the fire is drawn. In a few days the mother liquors separate and the tar is run off and washed with its weight of water by decantation. The liquors, if

kept to a proper strength, may be used repeatedly. The author has called this "soluble tar" because it is integrally soluble in 2 or 3 times its weight of distilled water. Greatly diluted, the preparation takes the form of a persistent emulsion resembling absinthe liquor.—*Nouveaux Remèdes*, Nov. 24.

SULPHORICINIC ACID AS A SOLVENT FOR ANTISEPTICS.—Berlioz and Ruault find that sulphoricinic acid, made by treating oil of ricinus with sulphuric acid, makes an excellent dissolvent for salol, naphthol, creosote, phenic acid, etc. This acid emulsionizes perfectly with water, whether or not mixed with the substances described. Ten per cent. solutions of naphthol and phenol are easily made in this way, and these are superior to the camphorated solutions of these substances on account of the readiness with which they unite with the moisture of the damp surfaces to which they are applied.—*Nouv. Rem.*, Dec. 8.

PREPARATION OF OXAMIDE AND OXAMIC ACID.—M. Mathieu-Plessy introduced oxalate of ammonia into fused nitrate of ammonia and maintains the mass at a heat of 338° to 347° F., for four hours. He thus obtains a compound which, taken up by water, yields 6½ per cent. of oxamide, and a quantity of oxamic acid corresponding to 54 per cent. of oxamate of baryta. —*Acad. des Sci.; J. de Phar. et de Chim.*, Nov. 15.

IODINATED MUSLIN.—Taking advantage of the property possessed by cellulose of fixing iodine, which is afterward set free under the influence of gentle heat, M. Méhu lately proposed a method of making "iodinated squares" to be applied in the same way as ordinary sinapisms of paper impregnated with the oil of mustard. The iodinated muslin is said to have certain advantages over applications of tincture of iodine, apart from its convenience. It acts more evenly, there is less irritation or blistering and the desired effect may be longer continued. In preparing the muslin, MM. Breaudat and Cathelineau have improved upon M. Méhu's process. They first place the fabric for a few minutes in a 2 to 100 solution of bi-carbonate of soda. They then press and wash it and let it remain for half an hour in a 4 to 100 solution of chloride of lime. Then it is again washed until no alkaline reaction is observed, when it is plunged into a 5 to 100 solution of

hydrochloric acid for a quarter of an hour, after which time the acid is washed out and the muslin carefully dried. The cloth is now fitted to retain the iodine vapors. The iodine, finely pulverized, is spread evenly upon both sides of the fabric, which is then loosely rolled and introduced into a jar. The latter is warmed until vapors begin to arise, when it is sealed and placed in a water-bath for two hours at 212° F. On cooling, the muslin is put away in glass jars for use.—*Répert. de Phar.*, Dec. 10, 1889.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Valence of Aluminium.—Nilson and Petterson, in their latest publication on the vapor density of aluminium chloride (*Zeitschr. für physik. Chemie*, 1889, p. 206) report on some experiments, which support their previous investigation and from which they draw the following conclusions: From the boiling point aluminium chloride is in constant dissociation until above 800° C. the state of a perfect gas is reached when the vapor density corresponds to the formula $Al Cl_3$, which does not change at the highest temperature obtainable. This proves without any doubt that aluminium is a trivalent element.

Alkaloidal Reagents.—A. L. Brociner (*Jour. Pharm. Chim.*, 1889 (5) *20*, p. 390) draws attention to a solution of 1 gm. perrutheniate or rutheniate of potassium in 20 cc. very pure concentrated sulphuric acid (sp. gr. 1·184) as a reagent for alkaloids. *Solanine*, with a drop of this reagent, in a few minutes begins to assume a red color, after about 20 minutes the whole liquid has acquired the same color, which disappears on slight heating. *Ononin* is colored immediately brownish-red. *Chelidonine* gives a green coloration. *Imperatorin*, at first blue, soon changes to an intense green. The latter reaction is best obtained with the perrutheniate, while rutheniate gives the best results with the rest. The author furthermore calls attention to a solution of 1 gm. ammonium uranate in 20 cc. concentrated sulphuric acid. This solution must be prepared just before using. *Codeine*, on slight heat-

ing, gives a blue color. *Imperatorin*, also, gives a blue color, which soon disappears, especially on heating. *Morphine* gives, on warming, a dirty green color, which slowly disappears.

Estimation of cinchona, with petroleum. Laudrin (*Comptes rendus*, through *Pharm. Centralh.*, 1889, 725) gives the following method for the assay of cinchona bark: To 300 gms. finely powdered cinchona, 75 gms. soda and 75 gms. calcium hydrate, sufficient water is added to dissolve the former, and the whole well mixed. Two litres of petroleum are then added and the whole heated to 100° C. for 20 minutes, the liquids being well shaken. The mixture is again treated with the same quantity of petroleum and this solution of the alkaloids treated several times with water acidified with sulphuric acid. The acid liquid is then carefully neutralized with ammonia, when, on cooling, 90 per cent. of the alkaloids separate. The mother liquor is then precipitated with soda, the alkaloidal mixture converted into the sulphate and weighed.

Abnormal Occurrence of Cholesterin.—J. B. Nagelvoort (*Nieuw Tijdschr. voor Pharm., Chem. en Toxikol.*, 1889, 305) noticed, when analyzing some cod-liver oil, needle-shaped crystals mixed with small truncated crystals, in place of the usual glossy leaflets. The crystals gave the cholesterin reaction, with sulphuric acid becoming reddish-brown and changing on addition of water to a dirty green.

Composition of Oil of Betel Leaves.—Prof. J. F. Eykman's results with this volatile oil, distilled by himself from fresh leaves, which had been in part reported in 1888, have been communicated to the German Chemical Society (*Berichte*, 1889, pp. 2736–2754). The oil was pale greenish-yellow, became golden-yellow and brown on exposure, was slightly levogyre and had the spec. grav. 0·969 at 15° C. Caustic potassa removed from the oil *chavicol*, a phenol of spec. grav. 1·030 at 15° C., boiling between 236° and 238° C., and having a peculiar odor, somewhat resembling that of creasote; its composition is $C_9H_{10}O$; its aqueous solution is colored blue by ferric chloride, the color disappearing on the addition of alcohol; its constitution is expressed by the formula $C_6H_4 < \overset{OH(1)}{C_3H_5(3)}$. The crude chavicol seems to contain

a small quantity of a phenol of somewhat higher boiling point, and in alcoholic solution becoming blue with ferric chloride. Betel oil, freed from phenol, did not yield, by fractionating, a pure compound in sufficient quantity for examination. The fraction between 173 and 176° contained several terpenes, but no pinene, and had a very agreeable lemon-like odor, while a mint-like odor was observed in the fraction between 190° and 220°. From the higher boiling fraction a hydrocarbon, sesquiterpene, was obtained, having a slight odor, boiling at 260° C., and in acetic solution acquiring a deep indigo-blue color with bromine.

The author also calls attention to the betel oil obtained by Schimmel & Co. (see AMER. JOUR. PHAR., 1889, p. 312) from dry betel leaves, and shows that the oil did not contain the above compounds to which the fresh leaves owe their characteristic odor; they may have been dissipated by drying, or oxidized by exposure, or lost by remaining dissolved in the water; the use of steam under pressure may have volatilized more of the high boiling phenol than is obtainable by ordinary distillation.

Safrol, when oxidized by potassium permanganate, yields, according to Th. Poleck (*Berichte der D. Ch. Ges.*, 1889, p. 2861) piperonal and piperonylic, carbonic, formic, acetic and oxalic acids, but no propionic acid, as was stated by Schiff in 1884.

THE SEEDS OF CALYCANTHUS GLAUCUS.[1]

By H. W. WILEY.

The weight of 100 seeds unhulled was found to be 21·1964 gm.; the average weight of each seed is therefore about 200 mgm.

The pods, hulls and kernels were examined separately. The pods and seed-hulls were ground in a drug mill and passed through a ½ mm. mesh sieve. On account of the great quantity of oil in the kernels, they were reduced to as fine a powder as possible on an iron plate or pulverizer, and the oil removed by petroleum spirit. The deoleated residue

[1] Abstract of a paper published in *American Chemical Journal*, December, 1889, pp. 557–567.—J. M. M.

was ground to a fine flour and passed through a ½ mm. mesh sieve. The following results were obtained:

	Pods.	Seed Hulls.	Kernels.	
			Unextracted	Extracted.
Moisture,	9·03	11·39	5·36	3·52
Petroleum spirit extract,	3·07	1·22	47·08	3·64
Ether extract,	3·25	0·30	1·29	0·31
Absolute alcohol extract,	1·73	0·54	9·69	17·33
80 per cent. alcohol extract,	1·87	1·09	2·48	6·33
Fibre insoluble in dilute acid and alkali,	29·26	30·71	1·36	2·85
Ash,	4·24	1·72	1·08	4·69
Albuminoids,	5·25	2·63	23·62	42·31
Digestible fibre, starch, etc., by difference,	42·26	50·40	8·05	13·00

A considerable quantity of albuminous matter is extracted by alcohol. The almost entire absence of starch is a noteworthy characteristic of calycanthus seed, a cooled decoction giving only a faint reaction with solution of iodine. The percentage of oil is very large; Dr. Eccles reported 39 per cent., but the author found over 47 per cent. The seeds contain nearly twice as much of albuminoids as wheat. The quantity of sugar (dextrose, sucrose and dextrin) is also large, and it is easy to see why the "bubby" berries are greedily sought after by cattle.

The oil from calycanthus seed has a faint yellow color, and a peculiar odor. Compared with water at the boiling point the specific gravity is ·9058 for the extracted and purified oil, and ·9110 for the expressed oil. It is free from volatile acids. The iodine absorption for the crude expressed oil was 129·53, and for the purified extracted oil 128·66 per cent. The fatty acids crystallized at 12·5. The refractive index of the oil determined by the Pullfrick refractometer at 28° is 1,47351, the index of pure water at the same degree 1·33338.

The alkaloid in calycanthus seed was discovered by Dr. R. G. Eccles, of Brooklyn (*Western Druggist; Druggists' Circular; Proceedings Amer. Phar. Assoc.*, 1888, pp. 84 and 382). The author obtained this aklaloid from the extracted oil, by wash-

ing the latter with dilute sulphuric acid (1·50) removing from the acid liquid traces of oil by petroleum, rendering alkaline by ammonia, and extracting the alkaloid by ether; yield ·027 per cent. of the oil.

Experimenting with the kernel of the seeds freed from hulls and deprived of fat by petroleum spirit, it was ascertained that ether, alcohol, chloroform, or a mixture of ether and alcohol would extract only a portion of the alkaloid. Better results were obtained with a mixture of ether, alcohol and ammonia. The following process yields the largest amount of alkaloid in a pure state: Digest for four days 10 gm. of the powder with 100 cc. of dilute sulphuric acid (1:50) at about 35° C.; make the emulsion-like mixture strongly alkaline with ammonia, shake with ether, pour off the slowly separating ethereal layer and evaporate; wash the resulting extract with about 100 cc. of dilute sulphuric acid, free this solution from fat, etc., by washing with ether, render strongly alkaline by sodic hydrate and shake with ether. Yield 4·25 per cent.

Calycanthine separates from ether in feathery crystals, or on slower evaporation, in triangular crystals.

By treatment as indicated above, the hulls yielded ·83 per cent. of alkaloidal principle, containing traces of calycanthine and an amorphous compound the nature of which has not yet been determined.

Dr. Eccles described the beautiful green color produced by nitric acid. The following additional color reactions were observed: H_2SO_4 pale yellow. H_2SO_4 + sucrose fine purple, persistent and changing finally to blue. $H_2SO_4 + K_2Cr_2O_7$ fine blood-brick-red.

Dextrose, maltose, etc., gave also the furfurol reaction but without so marked a purple as with sucrose. The presence of sugar in the seeds renders it possible to secure the furfurol reaction in the raw seed by the simple application of H_2SO_4.

Rubidium-Ammonium bromide, according to Dr. Rottenbiller (*Internat. klin. Rundschau*), when given in doses of 5 gm. daily, reduces the frequency of epileptic attacks, but like potassium bromide exerts no permanent effect in this disease.

ON SCOPOLA CARNIOLICA (*Jacquin*).

A series of papers were read at an evening meeting of the Pharmaceutical Society, in London, December 11, 1889, and published in *Pharmaceutical Journal and Transactions*, December 14, of which we give brief abstracts in the following. The introductory paper, by Prof. W. R. Dunstan, of the Research Laboratory of the Pharmaceutical Society, makes the following explanatory statements:

"Rather more than a year ago Mr. Ransom brought under my notice a rhizome which had recently appeared in the drug market, being offered as a substitute for the root of *Atropa Belladonna* under the name of *Belladonna Scopolia*. It was imported from Germany, and was stated to grow wild in the Carpathian Mountains and in other parts of Austro-Hungary. The juice of the plant was supposed to possess mydriatic properties. From further inquiries it appeared that an abundant supply of the plant could be obtained should any demand arise for it.

Two species of *Scopola* have already been made the subject of chemical investigation, viz., *Scopola japonica* and *Scopolina Hladnikiana* (see AMER. JOUR. PHAR., 1888, pp. 235 and 236). *Scopola japonica* has been used to some extent in medicine. The new rhizome was not, however, likely to be derived from either of these plants, since the first is indigenous to Japan and does not grow in Europe, while *Scopolina Hladnikiana* is rare and practically unknown outside the botanic garden.

Chemical investigation soon showed that we have in this plant a new and important source of hyoscyamine. The chemical examination of all the constituents of this plant is not yet quite complete, although the most important have been minutely studied. We think it desirable to publish our present results without delay, since it appears from an announcement in a recent number of a German periodical that at the meeting of the Naturforscher Verein, at Heidelberg, Prof. Schmidt, of Marburg, stated that he is working at a species of *Scopola* which seems likely to be the same as that we have investigated."

A second paper "on the Chemical Constituents" of the root, by Prof. Dunstan and A. E. Chaston, gives in detail the pro-

cesses for isolating the various constituents and determining their properties.

Of the known mydriatic alkaloids *Scopola carniolica* is shown to contain only one (hyoscyamine) in any appreciable quantity; there may also be present a minute amount of hyoscine, although we we were unable to conclusively prove this to be the case. *Scopola carniolica* appears to be distinguished from other plants which yield mydriatic alkaloids in containing hyoscyamine in an almost, if not quite, pure condition. It must, however, be borne in mind that in investigating the alkaloidal constituents of this plant advantage has been taken of the facts recently established with reference to the instability of hyoscyamine when in contact with fixed alkalis, or when heated to the temperature of boiling water. The plant was dried at a low temperature, exhausted with cold alcohol, and the alcoholic percolate was evaporated at 30°–40°, while no fixed alkalis were use in extracting the alkaloid. It has not yet been definitely established that atropine is actually present in belladonna, or indeed in any plant, and it has not yet been shown that the hyoscine which is often obtained, besides atropine and hyoscyamine, is a constituent of the plant, and has not been produced during the extraction of the alkaloids.

From the fatty and resinous constituents of the rhizome, by treating the acidulated mixture with chloroform, a mass of needle-shaped crystals was obtained melting at 137·5°, and on combustion yielding results, agreeing with the formulas $C_{26}H_{44}O$ or $C_{27}H_{46}O$, each of which has been assigned to cholesterin. The amount was rather more than 0·1 per cent. It appears to most nearly resemble phytosterin (from seeds) and daucosterin (from carrots), and to have been for the first time noticed in the natural order Solanaceæ. The authors obtained it also from the root of *Atropa Belladonna*, and approximately in the same amount as from the scopola rhizome. After recrystallization of the acids, obtained by saponifying the fat, they appear to consist mainly of arachic acid $C_{20}H_{40}O_2$.

A crystalline sugar has also been obtained which reduces Fehling's solution and yields an osazone apparently identical with that obtained from dextrose. A crystalline substance

which is highly fluorescent especially in alkaline solutions, appears to be identical with Eykman's scopoletin and with the chrysatropic acid of Kunz; there are grounds for believing it to be methyl-æsculetin.

The third paper is by F. Ransom, "on the Pharmacy of Scopola." The percentage of alkaloid was determined by a slight modification of the process proposed by Prof. Dunstan and the author for the essay of belladonna (see AMER. JOUR. PHAR., 1884, p. 279). Two samples of the root yielded ·43 and ·51 per cent. of alkaloid, while from belladonna root ·35, ·38 and ·39 per cent. had been obtained. Experiments made with menstruums of different alcoholic strength showed that a mixture of 4 parts of alcohol and 1 part of water extracted more alkaloid than a weaker or stronger spirit. Based upon these results, the following preparations are proposed:

Extractum Scopolæ alcoholicum.—Alcoholic extract of scopola.

Take of Scopola rhizome, No. 20 powder, ... 1 pound
Rectified spirit, ... 48 fluid ounces
Distilled water,
Sugar of milk, of each a sufficiency.

Mix the spirit with 12 fluid ounces of distilled water, macerate the scopola in two parts of this mixture for 48 hours, agitating occasionally; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with the remainder of the diluted spirit. Afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids and evaporate over a water-bath to the consistence of a soft extract. Estimate the alkaloidal strength of this extract by the following method:

Dissolve 2 grams of the extract in about 10 c. cm. of warm distilled water acidulated with a few drops of diluted hydrochloric acid. Pour the solution into a stoppered glass separator, and add ammonia until the liquid is distinctly alkaline. Agitate for a few minutes with 16 c. cm. of chloroform, separate and again wash the aqueous liquid with 3 c. cm. of chloroform. Agitate the mixed chloroform solutions with 10 c. cm. of diluted hydrochloric acid, separate, wash with 3 c. cm. of the diluted acid, mix the acid solutions, render alkaline with ammonia, and agitate with 10 c. cm. of chloro-

form. After separation wash the alkaline solution with 3 c. cm. of chloroform, mix the chloroform solutions, evaporate in a dish of known weight and dry the residue, which should be nearly colorless, at a temperature of 200° F. (93° C.). The weight of the residue thus obtained multiplied by 50 will give the percentage of alkaloid present in the extract. Having thus ascertained the strength, warm the extract over a water-bath in a dish of known weight and adjust by evaporation or by the addition of distilled water and sugar of milk in such proportion that the finished extract shall be of firm consistence and shall contain 2 per cent. of alkaloid.

Extractum Scopolæ liquidum.—Liquid extract of Scopola. It is proposed to be prepared with alcohol of the same strength, as is used for the extract. 100 cc. are to contain 0·25 gm. of alkaloid.

Emplastrum Scopolæ. — Plaster of Scopolæ. Alcoholic extract of scopola, 4 oz.; Resin plaster and Soap plaster of each, 8 oz. It contains nearly 0·4 per cent. of alkaloid.

Linimentum Scopolæ.—Liniment of Scopola. Liquid extract of scopola, 24 fluid ounces; Camphor, 1 oz.; Rectified spirit and Water, in the proportion of 4 to 1, sufficient to make 30 fluid ounces. Contains $\frac{1}{5}$ gr. alkaloid in 100 fluid grains.

Tinctura Scopolæ.—Tincture of Scopola. Liquid extract of Scopola, 4 fl. oz.; Proof spirit, 21 fl. oz. Contains $\frac{1}{25}$ gr. of alkaloid in 100 fluid grains.

Unguentum Scopolæ. — Ointment of Scopola. Alcoholic extract of scopola, 1 oz.; Benzoinated lard, 9 oz. Contains $\frac{1}{5}$ per cent. of alkaloid.

The fourth paper, entitled "Observations on the Therapeutic Action of Scopola carniolica," by Sir Dyce Duckworth, M.D., relates the action of the drug in seven cases, and concludes as follows:

So far as these few observations go, I think it justifiable to affirm that in scopola we have a drug which proves itself equally effectual with belladonna, and if it can be supplied at a cheaper rate than the latter drug, it can hardly fail to prove a boon to a large class of sufferers who can ill-afford to pay for efficient local employment of belladonna. I could have wished to adduce many more facts before this meeting, but

I am still investigating the properties of scopola, and may perhaps have the honor of adding to this communication at some future time. I am anxious to know if the extract proves as effectual for arrest of activity in the lacteal glands as does belladonna, also to try its properties in some varieties of heart disease.

The fifth paper, "The Natural History of Scopola carniolica (*Jacquin*)," gives a complete history of the synonymy of this plant, commencing with Matthioli, who in 1563 named it *Solanum somniferum alterum.* It was further described in 1622 by Caspar Bauhin under the name of *Solanum somniferum bacciferum;* in 1651 by J. Bauhin as *Solanum manicum* "quod secundo loco proponuimus;" in 1761 by J. A. Scopoli, Professor of Botany, at Pavia, as *Atropa caule herbaceo foliis ovatis, integris, fructu capsulari;* in 1764 by Jacquin as *Scopola carniolica;* in 1767 by Linnæus as *Hyoscyamus Scopolia;* in 1794 by Moench as *Scopola trichotoma;* in the same year by Schultes as *Scopolina atropoides;* in 1821 by Link as *Scopolia atropoides,* and in 1837 by G. Don as *Scopolia carniolica.*

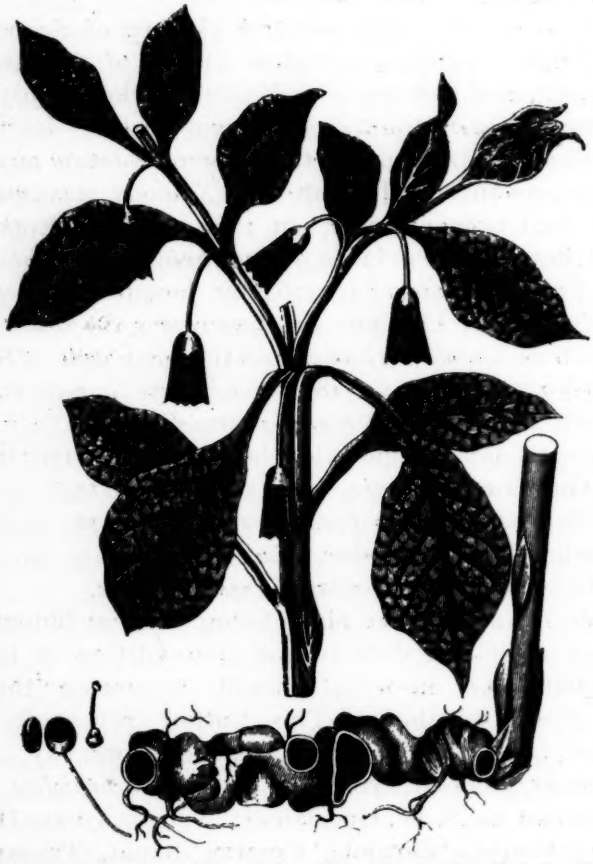
The generic name Scopolia had been applied in 1763 by Adanson for what is now *Ricotia, Lin., Cruciferæ;* in 1776 by Forster for what is now *Griselinia, Forst., Cornaceæ;* in 1781 by Linnæus fil., for what is now *Daphne, Lin., Thymelaceæ;* in 1790 by Smith for what is now *Toddalia, Juss., Rutaceæ.*

Jacquin's name for the plant being the first binomial one published after the date of the first edition of Linnæus' *Species Plantarum* in 1753, should supersede the later names given by others. This author repeatedly writes "Scopola" (*not* Scopolia) in his published work.

The geographical distribution of *Scopola carniolica* appears to be limited to S. W. Germany (Bavaria), Austro-Hungary (Styria, Carinthia, Carniola, Croatia, Banat, Transylvania) and S. W. Russia (Podolia and Volhynia). It grows in damp, stony places among bushes in beechwoods on calcareous soil, chiefly in hilly or mountainous districts. In appearance it closely resembles belladonna in shape of leaf, shape, color and position of flower, in the branching of the stem and in the floral leaves being frequently geminate. But it differs in its short stature (about 1 foot high) in the more reticulated

thinner leaves, the capsular, transversely dehiscing fruit and in the presence of a rhizome.

Two varieties of the plant were described by Koch (Syn. II, p. 585), the common form having tubular bell-shaped flowers of a brownish-purple color, and the other growing at



SCOPOLA CARNIOLICA (*Jacquin*).—(From Jacq. Obs. Bot. I, tab. 20.)

a higher elevation, having an obovate-campanulate corolla of a green color. The latter was described by Koch under the name of *Scopolina Hladnikiana*,[1] suggested to him by Freyer, who also issued the plant as *Scopolina viridiflora* in Raben-

[1] In Prof. E. Schmidt's paper, published in *Archiv der Phar.*, 1888, p. 214, the specific name is given as *Hlardnackiana*.—Editor AM. JOUR. PHAR.

horst's *Flor. Eur. Exsicc.*, No. 2056. A third variety, with yellow conical-campanulate flowers, is mentioned by Decandolle under the varietal name *β concolor*.

The genus forms a link between the genera *Hyoscyamus* and *Atropa*. In the tissue of the rhizome it more nearly approaches the latter genus in having the peculiar sandy raphides present in both root and leaves of belladonna, but not in henbane.

Bentham and Hooker refer two other plants to the genus "Scopolia," viz: *Scopola japonica* and *S. lurida*. The former was described by Maximowicz; but in a recent letter he states that he has strong doubts about its being a good species, and that it is hardly different from the European plant.

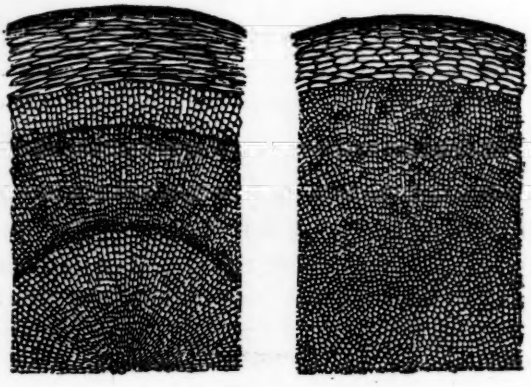
S. lurida, Dun., is a Himalayan species, which has also been referred to under the names, respectively, of *Anisodus luridus*, Link and Otto; *Nicandra anomala*, Link and Otto; *Physalis stramonifolia*, Wallich; *Whitleya stramonifolia*, Sweet; *Anisodus stramonifolius*, G. Don. The large fusiform root seems worthy of chemical investigation since, according to the late Dr. E. J. Waring, it is as powerful as belladonna, if not more so. Mr. Holmes finds in the fresh root the peculiar raphides common to the other two species, but more abundant in the cortical portion. The leaves, flowers and calyx of the plant recall the characters of *Physalis* rather than of *Scopola*.

The sixth paper, by Thomas Greenish, compares "the histological characters of the rhizome of *Scopola carniolica* with those of the *Atropa Belladonna*."

Immediately under the epidermis of the belladonna root there is a layer of cortical cells forming a dark line. On isolating the individual cells it is found that this cortical layer consists of from six to eight tabular cells deeply colored. Next below on the drawing but inward in the root, are several layers of thin cells, pressed or stretched in a tangential direction, long and narrow; and further down again several layers of cells not so long and wide, being subjected to less pressure they tend more toward the shape of the cell in its normal condition. These together constitute the bark.

Within the bark there is a faint, thin line, the cambium layer, externally surrounding the vascular bundles, which are themselves imbedded in the cellular or fundamental tissue, and in somewhat definite lines. The cells of the bark within that dark line are of a faintly-brown color, and the same remark applies to the cells composing the fundamental tissue, but there is an entire absence of schlerenchymatous cells.

All the parenchymatous cells of the bark and from the bark inward are more or less filled with starch grains, but these were removed to make the structure more visible. Most of them *in situ* are compound grains, being composed of two or more adhering together. The typical form is the muller-



SECTION OF BELLADONNA ROOT.

SECTION OF SCOPOLA RHIZOME.

shaped grain. When the combination is a doublet they adhere by their truncated bases, and when a triplet they are muller-shaped with dihedral bases. A dark spot will be seen here and there in the fundamental tissue. These are cells of raphides cut in a transverse direction. Examining these raphides by a micro-chemical process, the application of acetic acid slowly permeating the tissues under the slide, there was no effervescence, and it was concluded that the raphides are not composed of a carbonate; most probably they are oxalates. Longitudinal sections of each were made, but they exhibited nothing special beyond the cells above referred to, in their length showing a long cell or sac filled with raphides.

Passing now to a description of the *Scopola carniolica*, the dark line under the epidermis is narrower and less colored than that of belladonna. The entire bark is not so thick; also, the vascular bundles are neither so large nor so numerous, and the bundles of raphides are less bold than in the belladonna root. In fact, much the same tissues are present, but less pronounced than in belladonna. The starch grains also are smaller, the typical grains being, as in belladonna, muller-shaped, but there is a large number which it is difficult to assign to any well-defined type of starch grains.

Very minute details, when they do not serve to elucidate any point in this investigation, have been avoided. On the whole it will be evident from this histological interpretation that there seems a close alliance in anatomical structure between the rhizome of *Scopola carniolica* and the root of *Atropa Belladonna*.

ADDITIONAL NOTES ON SCOPOLA.

By John M. Maisch.

As a supplement to the highly valuable information contained in the foregoing paper, the following historical and pharmacognostical notes will be found of interest.

Wittstein, in *Handwörterbuch der Pharmakognosie*, 1882, p. 787, writes that "Matthiolus discovered this plant in the sixteenth century near Görz, and also figured it, but it seems to have been forgotten, until Scopoli (†1788) found it again near Idria. . . . Wier's experiments with the plant as a remedial agent received little attention. In more recent times Dr. Lippich, of Padua, again used the undoubtedly very active plant in such diseases which have thus far been usually treated with belladonna."

Schroff (*Pharmacognosie*, edit. 1869, p. 299) states that "the plant which grows near Idria, Laibach, in Hungary, etc., has recently been again more frequently employed, particularly the leaves, herba scopolinæ, and the root, radix scopolinæ. . . . The rootstock is almost horizontal, 0·026–0·04 m. thick, of a whitish color, in some places thickened, almost jointed, has few annulations, produces upon a protuberance occasion-

ally several buds, and has few long rootlets." However, the drug appears to have attracted little attention at that time, even in Austria and Hungary; for it is not mentioned in Prof. Schroff's *Pharmacologie* (1863), nor in the official report by the same author on the medicinal substances exhibited in 1873, at the international exposition at Vienna.

According to Schleiden (*Pharmacognosie*, 1857, p. 501), the leaves of this plant are employed in Southern Europe in precisely the same manner as belladonna leaves. It is probable that these references are based upon the observations of Dr. Lippich mentioned above.

A brief notice of the latter was published in Buchner's *Reportorium* (1844) lxxxiv, p. 386, in connection with a note on an essay by Dr. Köstl.[1] "*Scopolina atropoides* merits all praise as an excellent remedy in salivation, ulcers of the mouth following the use of mercury, offensive breath from ulcerations, scrofulous ulcers of the nose, syphilitic ulcers, bone ache, aphthæ, etc. Prof. Lippich has published in detail his observations with the remedy in the medical annals (*Jahrbücher*) of Austria, vol. xx. . . . It is used like belladonna; the root seems to merit the preference. . . . Most interesting information is contained in vol. ii, p. 771–775 of "Die neuesten Entdeckungen in Materia Medica," by Prof. Dr. Dierbach.

Previous to that time the plant was also mentioned in certain works. Thus, Martius (*Pharmakognosie*, 1832, p. 174) stated that the leaves have been mistaken for belladonna; and Kosteletzky (*Med. Phar. Flora*, 1832, p. 944) described the plant and added that "it possesses the same narcotic properties as hyoscyamus, and has also been employed by several physicians in various nervous complaints, but on account of its limited occurrence has never been in general use."

The plant and its uses are not alluded to in the universal pharmacopœias by Jourdan and by Geiger and Mohr, which were published about the same time as the two works last mentioned. But in some later works the statement is found

[1] **Observationes et experientiæ, quas citra remedia eorumque formulas in Instituto medico-clinico Patavino a Prof. Lippich directo, septem annorum (1834–1841) cursu præscribi solita conscripsit, et medicorum usui adcommodavit Dr F. Köstl. Viennæ, 1843, apud Braunmüller et Seidel.**

of the leaves being mistaken for belladonna, for instance in Berg's and in Wiggers' *Pharmacognosie*, in Henkel's "Die Merkmale der Aechtheit," etc., in Wolff and Hirsch's "Prüfung der Arzneimittel," in the "National Dispensatory," etc. According to Moeller's *Pharmakognosie* the leaves resemble—more than those of *Solanum nigrum*—the leaves of belladonna, but they are smooth and are free from cells containing crystalline sand.

Regarding the distribution of the plant in the southern part of Central Europe, Kosteletzky states that it grows in shady woods in Bavaria, Carniola, Hungary and Croatia; but according to Garcke (*Flora von Deutschland*) it is indigenous to Carniola, and within the boundaries of Germany it has merely run wild in grassy places, for instance in Silesia.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 21, 1890.

The meeting was called to order by asking Mr. A. Robbins to preside.

The minutes of the last meeting were read, there being no corrections called for they were ordered to stand approved.

A copy of the Proceedings of the American Pharmaceutical Association was presented to the library by Professor Maisch, the permanent Secretary.

The Year-Book of Pharmacy of the British Pharmaceutical Conference, which answers in many respects to the report on the progress of pharmacy of the American Pharmaceutical Association was also presented to the library by the Conference.

The third edition of the Pharmacopœa Nederlandica, published in 1889, was exhibited. This has just been received from Europe.

A paper upon *beef, wine and iron* was read by E. G. Eberhardt, a member of the present senior class, which exhibited the character of some of this preparation as found in the market.

A paper upon *Eupatorium purpureum* was read by Professor Trimble. Professor Maisch inquired if any experiments had been made to ascertain its color reactions. Professor Trimble said that an alcoholic solution of ferric chloride merely darkened the solution somewhat, giving scarcely any reaction. He thought that Mr. Ray failed to obtain the crystalline principle, because of the small quantity of material he worked with. Professor Maisch stated that since the crystalline principle had been received from Professsor Lloyd in 1876, it had been sent to him by three or four other parties; samples which he had tested had given a dark green color with ferric chloride, similar to that produced by quercitrin; Professor Trimble had now shown that after purification the principle does not give this reaction.

Professor Maisch showed some frames from the first volume of a work, entitled *American Woods*, and published by R. B. Hough, Lowville, N. Y.;

each frame contains three sections—transverse, radial and tangential—made through the sap and heart-wood of an American tree, either native or introduced, and cut sufficiently thin to allow, in a measure, the transmission of light, so that they may be used as slides for the oxyhydrogen lantern, or inspected by the aid of the microscope. The trees having been identified by the author in the field, before felling, for preparing the sections, the authenticity of the specimens renders the work of especial interest to the professional botanist as well as to intelligent persons generally. Similar sections of woods have been used for business and fancy cards, and found application for a variety of uses in the arts.

Mr. G. M. Beringer exhibited a sample of the true *patchouli leaves*, not often seen by the druggists. They are of frequent and almost continual use by perfumers. Some years ago Mr. E. M. Holmes, Curator of the Museum of the British Pharmaceutical Society, showed that the commercial leaves are sometimes adulterated, and that substitutions have been met with, which may be distinguished by the shape of the leaves and by their anatomical characteristics.

Mr. Beringer also exhibited some *cassie flowers*, the flowers of *Acacia Farnesiana*, said to be grown in the neighborhood of Charleston, S. C. As usually met with in the market, cassie flowers, though indigenous to tropical America, are obtained from Northern Africa and France, where the tree is cultivated. Mr. Beringer said that he had seen it stated that the plant was also indigenous to Texas, Mexico and to Australia.

Professor Maisch stated that he had imported some new botanical models of flowers and fruits which he would be glad to exhibit to the members at his cabinet room; it was suggested that a committee be appointed to bring them down in time for the next meeting, and return them to their place after their exhibition.

On motion, there being no further business, the meeting adjourned.

T. S. WIEGAND, *Registrar.*

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the American Pharmaceutical Association at the Thirty-seventh Annual Meeting, held at San Francisco, Cal., June, 1889. Also the Constitution, By-laws and Roll of Members. Philadelphia: Published by the American Pharmaceutical Association. 8vo. Pp. xxiv and 850.

Year-book of Pharmacy, comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry, contributed to British and foreign journals from July 1, 1888, to June 30, 1889; with the Transactions of the British Pharmaceutical Conference at the Twenty-sixth Annual Meeting, held at Newcastle-on-Tyne, September, 1889. London: J. & A. Churchill. 8vo. Pp. 559.

With the beginning of the new year these two annuals have made their appearance. The American publication contains the "Minutes" upon 312 pages, which includes the thirty-seven papers read at San Francisco, a goodly number having been contributed by members from the Pacific Coast. The following 433 pages are occupied by the "Report on the Progress of Pharmacy," which corresponds to the "Year-book" of the British publication. The "Transactions" include the text of the thirty-two papers read at Newcastle. Accounts

of the two meetings, including a synopsis of the various papers, were published in the August and September numbers of our preceding volume. The "Unofficial Formulary Addenda" contains formulas for nine preparations, which we intend to republish in our next issue.

A Manual of Organic Materia Medica, being a guide to materia medica of the vegetable and animal kingdoms, for the use of students, druggists, pharmacists and physicians. By John M. Maisch, Ph. M., Phar. D., etc. Fourth edition, with 259 illustrations. Philadelphia: Lea Brothers & Co. 12mo. Pp. 539.

The publication of four editions of this work within eight years indicates that there was a need for such a work, which has been filled by the one bearing the above title. The preface of the present edition states that "it is in the nature of descriptive works that a certain monotony, inseparable from the material treated of, renders the text uninviting to casual readers not interested in the subjects, or ignorant of the intrinsic importance of the various details." It is then shown that for practical application a description of the *essential* physical, histological and chemical characters of organic drugs is needful as a guide in studying the different drugs and determining the variations caused by diverse agencies; also how such studies may lead to further original research. The literature on the subject has been carefully collected and condensed; but though also a few drugs have been added, the principal change was made in the list of drugs arranged according to origin, in which Beatham and Hooker's *Genera plantarum* has been followed, which seemed to be particularly appropriate in view of the approaching revision of the United States Pharmacopœia.

The following *Proceedings of State Pharmaceutical Associations* have been received:

Arkansas.—Seventh Annual Meeting. Pp. 64. See our last volume, p. 377.

New Hampshire.—Sixteenth Annual Meeting. Pp. 46. Next meeting at The Weirs, September 9th. Geo. F. Underhill, Concord, is President, and Chas. B Spofford, Claremont, Secretary.

North Dakota.—Fourth Annual Meeting. Pp. 32. See last volume, p. 538.

South Dakota.—Fourth Annual Meeting. Pp. 57. See last vol., p. 539.

Wisconsin.—Tenth Annual Meeting. Pp. 64, and Report of the State Board of Pharmacy, Pp. 40, —. See last volume, p. 539.

OBITUARY.

Professor Philipp Weselsky died in his native town Saar, Moravia, November 14, 1889, in the sixty-second year of his age. He served an apprenticeship in pharmacy, then studied in Vienna, and in 1854 became the assistant of Professor Schroetter in the chemical laboratory of the Vienna Polytechnic Institute, who in 1869 was succeeded by H. H. Hlasiwetz. After the sudden death of the latter in 1875, Weselsky became his successor until, in 1883, failing health induced him to resign the position in an institute where he had labored successfully for twenty-nine years. His original investigations led to the discovery of coloring matters, derivatives of phloroglucin and resorcin, and

embraced also the nitro-compounds of phenol, eugenol, pyrogallol, hydroquinone, pyrocatechin and other compounds.

Paul Balluff, a prominent pharmacist of New York City, died there of pneumonia, January 8th, at the age of 64 years. He was born in Riedlingen, Würtemberg, and, with his elder brother, served his apprenticeship in the pharmacy of his father, and subsequently as assistant in several pharmacies in Germany and Switzerland. After attending the university at Tübingen he passed the State's examination for Würtemberg in 1850, but in 1852 came to this country, locating at first in Williamsburg, N. Y., and afterward in New York City. He was a very active member, and for some years the presiding officer, of the German Apothecaries Society of New York and of the New York College of Pharmacy; he was also at one time a vice-president of the American Pharmaceutical Association. Two daughters survive him.

Emlen Painter, Ph.G., President of the American Pharmaceutical Association, for the current year, died at Spuyten Duyvel, N. Y., January 15th, of consumption, in his 46th year. He was born at Concord, Delaware County, Pa., educated there in the Friends' school, and became an apprentice to Chas. Shivers, in Philadelphia, where he graduated from the College of Pharmacy, in 1866. In the following year he went to San Francisco, where he was in business for about sixteen years, during which time he did good service in assisting in the establishment of the California College of Pharmacy, and as Professor of Pharmacy in this institution. He returned East in 1883, locating in New York City, where he conducted the Brunswick Pharmacy until a short time before his death. There he identified himself with the New York College of Pharmacy and served as one of its Trustees with his accustomed faithfulness and energy. In the American Pharmaceutical Association he was on several occasions nominated by the California pharmacists as their representative; and in the meetings he soon became conspicuous through his earnestness. The selection of San Francisco as the place for, and the success of last year's meeting is largely due to his energy and perseverance. His remains were interred in Woodland Cemetery, in Philadelphia. The deceased leaves a widow and five children.

Charles H. Cressler, Ph.G., died in Chambersburg, Pa., of pneumonia, January 29th, aged 51 years. He learned the drug business in his native town, with Wm. Heyser, graduated from the Philadelphia College of Pharmacy, in 1861, and afterward was in business in Chambersburg until the time of his death. He was to some extent instrumental in bringing to the prominent notice of physicians two drugs of American origin, both of which were admitted into the last pharmacopœia. His thesis on the "ergot of Indian corn"—now officinal as Ustilago—was published in this journal 1861, p. 306; and he pointed out (*ibid.*, 1878, p. 290) the efficacy of the rhizome of Aspidium marginale, now recognized, with that of male fern, under the official title Aspidium. The deceased was one of the original members of the Pennsylvania Pharmaceutical Association, and rendered faithful service for a series of years, on committees and as president. He also took a prominent part in all measures for the advancement of his native town and county, and for many years was a very efficient member of the school board.